

SNT-101-202X – Master Draft-Final
06.24.22

Proposed American National Standard

For Power Tools

Safety Requirements for
Portable
Compressed-Air-Actuated
Fastener Driving Tools

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Safety Requirements for
Portable
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Fastener Driving Tools

Sponsor / Standards-Developer

International Staple, Nail and Tool Association (ISANTA)

Approved

April 7, 2015

American National Standards Institute, Inc.

Abstract

American National Standard for Power Tools - Safety Requirements for Portable, Compressed-Air-Actuated, Fastener Driving Tools, ANSI SNT-101-2015, sets forth safety requirements for tool manufacturers, owners, employers (including self-employed contractors), designers, safety professionals, supervisors, operators, purchasers, users and other persons concerned with or responsible for the safe design, construction, use, repair, and maintenance of these tools. The tools are powered by compressed air. The tools drive nails, staples and other fasteners, typically in the industrial size range. The covered tools are used for fastening applications that generally, but by no means exclusively, involve wood-to-wood connections as found in commercial and residential building construction (framing, sheathing, decking, flooring, insulation, finish work, factory-build units and components, and coverings for walls, ceilings and roofs, etc.); carton closure; and the manufacture of furniture, box-spring assemblies, containers (boxes, pallets, crating, etc.), cabinets, etc.

American National Standard

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Published by

International Staple, Nail and Tool Association
8735 West Higgins Road, Suite 300, Chicago, IL 60631-2738

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Printed in the United States of America

FOREWORD

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The Safety Requirements for Portable, Compressed-Air-Actuated, Fastener Driving Tools contain safety requirements for tool manufacturers, tool purchasers and tool operators, and is intended to provide safeguards for persons and property from accidental hazards arising from the use of compressed-air-actuated fastening tools, often referred to as "nail guns" by users and operators. It is also intended to assist government and other regulatory bodies in the development, promulgation and enforcement of appropriate safety directives.

The sponsor for this standard is the International Staple, Nail and Tool Association (ISANTA). Consensus for this standard was achieved by use of the ANSI Canvass Method. Information for this publication was obtained from sources believed to be reliable and was considered technically sound at the time it was developed. It should not be assumed that all acceptable safety requirements are contained in this document or that different measures may not be required under certain circumstances or conditions.

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The following organizations were recognized as having an interest in safety requirements for power fastening tools and were canvassed prior to, and participated in, the consensus process leading to the approval of this standard:

Accent Building Materials, Inc.
Asphalt Roof Manufactures Association
Beck America
California Framing Contractors Association
Consumer Product Safety Commission
Falcon Fasteners Reg'd
Hilti Corporation
Home Depot Inc.
Intertek Group plc
Illinois Tool Works, Inc.
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National Nail Corporation
National Roofing Contractors Association
Power Tool Institute
PrimeSource Building Products Inc.
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Ted Gogoll
The Center for Construction Research and Training
Underwriters Laboratory, LLC
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Zonda Media-Journal of Light Construction

At the date of the April, 202X printing of this standard, the membership of ISANTA consisted of the following companies:

Accent Building Materials Inc.
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1 Scope, Purpose, Units and Effective Date

1.1 Scope

The requirements of this standard apply to portable hand-held compressed-air-powered tools for driving fasteners, such as nails and staples, into or through concrete, fabric, fiberboard, metal, plastic, wood, wood products, cartons, and other materials.

1.2 Purpose

This standard establishes safety requirements for the design, construction, use, repair, and maintenance of portable hand-held compressed-air-powered tools to guard against the injury of tool users and bystanders. It provides guidelines to designers, manufacturers, owners, employers (including self-employed contractors), supervisors, purchasers, safety professionals, operators and other persons concerned with or responsible for the safe use of these tools, and assists in the promulgation of appropriate safety directives and safety training programs.

1.3 Units

This standard contains customary units as well as SI (metric) units. Requirements are based on customary units. SI units in the text have been directly (soft) converted from the customary units.

1.4 Effective Date

This standard shall apply only to tools manufactured subsequent to the effective date of this standard. The effective date of this standard --XXXXXXXXXX, 202X-- is twelve months after its approval by the American National Standards Institute.

2 Definitions

2.1 activate (operating controls): To move or otherwise engage an operating control so that it is in a state that allows the tool to be actuated or that satisfies one requirement for the tool to be actuated.

2.2 actuate (tool): To cause movement of the tool component(s) intended to drive a fastener.

2.3 actuation system: A trigger, workpiece contact and/or other operating control, used separately or in some combination or sequence, to actuate the tool.

2.3.1 single-sequential actuation: An actuation mode which allows single driving operations via the trigger after the workpiece contact has been operated.

Further driving operations are possible via trigger operation if the workpiece contact has remained in the operating position.

- 2.3.2 full-sequential actuation: An actuation mode which allows single driving operations via the trigger after the workpiece contact has been operated. Further driving operations are only possible after the trigger and the workpiece contact have been returned to the non-driving position.
- 2.3.3 contact actuation: An actuation mode which allows the tool to operate by operating the workpiece contact while the trigger is continually depressed and held.
- 2.3.4 selective actuation: An actuation system that allows discrete selection of two or more of the following actuation systems: single-sequential actuation, full-sequential actuation, contact actuation with automatic reversion, continual contact actuation or contact actuation. One or more of the selections shall be single-sequential actuation or full-sequential actuation.
- 2.3.5 automatic reversion actuation: An actuation mode capable of contact actuation or continual contact actuation and where the tool becomes inoperable if an operating control is depressed without operation of the workpiece contact within the manufacturer's stated trigger time-out period.
- 2.3.6 continual actuation: An actuation mode in which the driving operations are carried out for as long as the trigger remains in its operating position (for tools without a workpiece contact).
- 2.3.7 continual contact actuation: An actuation mode in which the driving operations continue as long as the trigger and the workpiece contact remain in their operating positions.
- 2.3.8 single actuation: An actuation mode in which the trigger has to be operated for each driving operation (for tools without a workpiece contact).
- 2.4 air inlet port: The opening on the tool to which the air hose is connected, usually by means of a threaded fitting.
- 2.5 coil nailer: A nailer that drives fasteners from a collated coil of nails. The primary application of this tool is production applications.
- 2.6 collating material: The material for joining together single fasteners in strips or coils with adhesive, paper or plastic tape, plastic strap or wire.

- 2.7 distributor: Any retailer of products manufactured and/or sold by the tool manufacturer including dealers, franchisees, or any other wholesale or retail outlet.
- 2.8 dual trigger: Trigger arrangement comprised of two triggers that work in conjunction with each other such that both triggers require activation to actuate the tool. A sequence of activation may be necessary for tool actuation.
- 2.9 employer: The person, firm or company that contracts, hires, or is responsible for the personnel operating a tool. The employer is typically, though not necessarily, the owner, renter, or borrower of the tool. The employer also could be the operator of the tool.
- 2.10 fastener: A staple, pin, brad, nail, or other fastening device that is designed and manufactured for use in the tools within the scope of this standard.
- 2.11 heavy-duty stapler or finish nailer: A stapler or finish nailer capable of driving:
- 2.11.1 18 gauge (American Steel Wire Gauge) [0.0475-inch nominal diameter (1.2 mm)] or heavier wire, or
 - 2.11.2 staples having nominal thickness of 0.0318 inch (0.8 mm) or larger, or
 - 2.11.3 staples having nominal width of 0.0475 inch (1.2 mm) or larger.
- The primary application of this tool is production applications.
- 2.12 jam: An obstruction in the fastener feed or drive area of a tool.
- 2.13 light-duty tool: A tool designed to only drive fasteners meeting both of these requirements:
- 2.13.1 fasteners 1 inch (25.4 mm) or shorter (nominal length) and
 - 2.13.2 fasteners made from wire with:
 - 2.13.2.1 cross-sectional area less than 18 ASWG (American Steel Wire Gauge) [0.0475-inch diameter (1.2 mm)], or
 - 2.13.2.2 staples with nominal thickness less than 0.038 inch (1.0 mm) and with nominal width less than 0.050 inch (1.3 mm).
- 2.14 maximum air pressure: The maximum allowable pressure of the compressed air, as specified by the manufacturer, for operating a tool.
- 2.15 may: This word is understood to be permissive.

- 2.16 operating control: A control that separately, or as part of an actuation system, can cause the actuation of a tool.
- 2.17 production application: High volume, production-like applications, either at a facility, manufacturing setting or on-site, such as, but not limited to, pallets, furniture, manufactured housing, upholstery, and sheathing and roofing.
- 2.18 shall: The word “shall” is to be understood as denoting a mandatory requirement.
- 2.19 Special tools: Tools with different requirements due to application
- 2.19.1 multi-blow tool: A fastener driving tool that drives a fastener with more than one stroke of the driving element
- 2.19.2 pinner: A tool capable of driving predominantly headless fasteners meeting both of these requirements:
- 2.19.2.1 2 inches (51 mm) in length or shorter (nominal length) and
- 2.19.2.2 Cross-sectional area 23 ASWG (American Steel Wire Gauge) [0.0258 inch nominal diameter (0.64mm)] diameter or less.
- Larger gauge pinners are available.
- 2.19.3 single-blow tool: A fastener driving tool that drives a fastener with a single stroke of the driving element.
- 2.19.4 special application tool: A tool without a workpiece contact whose fasteners are formed or clamped during application by devices such as integrated anvils or self-contained clinching anvils which prevents free flight of fasteners.
- 2.19.5 tool without workpiece contact: Any tool that drives a fastener and which does not have a workpiece contact.
- 2.20 thickness (staple leg): The maximum dimension of staple-leg cross section measured parallel to staple-crown axis.
- 2.21 tool: A portable hand-held device for driving fasteners that is powered by compressed air.
- 2.22 trigger: A tool operating control activated manually by a tool operator.

- 2.23 trigger time-out period: For tools with automatic reversion; the duration of time a trigger can be depressed without operation of the workpiece contact before the tool becomes inoperable. This duration to be no longer than 5 seconds.

Note: Nothing in this definition prohibits a time-out period on the workpiece contact of more than 5 seconds.

- 2.24 width (staple leg): The maximum dimension of staple-leg cross section measured perpendicular to staple-crown axis.
- 2.25 workpiece: The object into which a fastener is intended to be driven by a tool.
- 2.26 workpiece contact: An operating control element or assembly on the tool intended to be activated by contact with the material to be fastened, before a fastening operation can be performed.

3 Design and Construction

3.1 Tool Operating Controls

3.1.1 Trigger

All tools shall be equipped with a trigger. All tools shall be designed so that the tool cannot be actuated when the trigger is in a released position (i.e., in an “off” position). The body of the tool shall be designed, and the trigger shall be located so as to minimize unintended activation. This protection can and generally is afforded by the surrounding structures of the tool. A need for a discrete trigger guard is not implied.

3.1.2 Workpiece Contact

In addition to the requirements of Clause 3.1.1, all tools, other than light-duty tools and those excluded in Clause 3.1.4.2, shall be equipped with a workpiece contact. Such tools shall be designed so that the tool cannot be actuated unless both the trigger and the workpiece contact have been activated. The purpose of this requirement is to prevent actuation of the tool when only the trigger is activated. The workpiece contact shall be designed so that it does not become deformed or inoperable under intended use.

3.1.3 Actuation System Options

All tools, other than light-duty tools, heavy-duty staplers, and coil nailers, shall be manufactured with an actuation system meeting the requirements of single-

sequential actuation, full-sequential actuation, selective actuation, or contact actuation with automatic reversion.

- 3.1.3.1 Tools manufactured with selective actuation shall be shipped with their actuation system set as single-sequential actuation, full-sequential actuation, neutral or off.
- 3.1.3.2 Certain applications and certain users may require different actuation system options for purposes of functionality and utility. In such cases, other actuation systems may be available. Means for making such other actuation systems available include, but are not limited to, the following:
 - 3.1.3.2.1 Actuation system is provided with, but not installed on the tool. Such actuation system is in addition to the actuation system manufactured with the tool to meet the requirements of Clause 3.1.3.
 - 3.1.3.2.2 Actuation system is offered as a conversion option.
 - 3.1.3.2.3 Actuation system is manufactured and shipped as part of the tool, in response to an order from a production application customer.
- 3.1.3.3 Tools intended to drive fasteners into hard surfaces such as steel or concrete shall be designed with only single sequential or full sequential actuation modes. Contact force to operate the tool shall be 1.25 times or more of the tool weight including the maximum weight of the fasteners but minimum 11.24 lbf.

3.1.4 Other Tool Operating Control Options

- 3.1.4.1 Manufacturers may offer additional actuation system options for production applications, beyond those specified in Clause 3.1.3, for any tool model.
- 3.1.4.2 For tools, other than light-duty tools, it might not be practical to meet the requirements of Clause 3.1.2 and for those tools, a workpiece contact is not required, provided the requirements of either Clause 3.1.4.2.1, 3.1.4.2.2 or 3.1.4.2.3 are met.
 - 3.1.4.2.1 The tool is offered with a dual trigger option and the tool is designed to only drive fasteners meeting the requirements of Clause 2.13.2 or 2.19.2.

- 3.1.4.2.2 The tool is equipped with a self-contained clinching anvil(s.) (Examples include, but are not limited to, carton closing staplers, sisal/bedding tools with fixed anvils, carton pliers.)
- 3.1.4.2.3 The same degree of safety as provided by Clause 3.1.2 can be demonstrated or is obtained by other means (Examples may include palm nailers, hardwood flooring tools, multi-blow metal hardware nailers, etc.)

3.1.5 Direction of Discharged Air and Lubricants

Discharged air and lubricants emitted during operation of fastener driving tools shall be directed so that the user of the tool is not subjected to a safety hazard, either directly or indirectly, for example, as a result of dust being raised from the workpiece. This can be achieved by methods such as using exhaust deflectors.

3.1.6 Ergonomics

3.1.6.1 Handle Design

The tool handle shall be designed considering the following ergonomic principles:

- the space between the handle and the magazine shall be sufficient to accommodate the operator's grasp;
- the space between the handle and the magazine and the length of handle behind the trigger shall accommodate the wearing of work gloves;
- the handle and trigger shall have no operational preference to right-hand or left-hand operation.

To allow the picking up of the tool while moving between working areas without operating the trigger, the grasping length immediately behind the trigger shall be ≥ 2.9 inches (74 mm) .

3.2 Marking

- 3.2.1 All tools shall be marked visibly, legibly and indelibly. Markings shall be located so as to withstand normal wear and tear throughout the expected life of the tool. Markings shall include the following information:

- 3.2.1.1 Manufacturer's or distributor's identity

- 3.2.1.2 Model number

- 3.2.1.3 Serial number or date code
 - 3.2.1.4 Maximum air pressure
 - 3.2.1.5 Specifications of fasteners which can be used in the tool to include minimum and maximum diameter, length and characteristics such as gauge and angle
 - 3.2.1.6 Interchangeable magazines shall be marked on the magazine (if the magazine changes the recommended fasteners for the product) in such a way that the appropriate fasteners can be identified.
- 3.2.2 The principles of ANSI Z535.1, *American National Standard for Safety Colors*, ANSI Z535.3, *American National Standard for Criteria for Safety Symbols*, and ANSI Z535.4, *American National Standard for Product Safety Signs and Labels*, related to color, configuration, format and signal word shall be used as guidelines for safety messages.
- 3.2.3 All tools shall be marked with the following safety warnings, or equivalent, unless the design of the tool requires otherwise:
- 3.2.3.1 Read and understand tool labels and manual. Failure to follow warnings could result in DEATH or SERIOUS INJURY.
 - 3.2.3.2 Operators and others in work area MUST wear safety glasses with side shields.
 - 3.2.3.3 Keep fingers AWAY from trigger when not driving fasteners to avoid accidental discharge.
 - 3.2.3.4 Know and understand what trigger system you are using. Check manual for triggering options.
 - 3.2.3.5 NEVER point tool at yourself or others in work area.
 - 3.2.3.6 NEVER use oxygen or other bottled gasses. Explosion may occur.
- 3.2.4 All tools shall be marked with the following safety symbols. Alternate symbols evaluated in accordance with ANSI Z535.3 and meeting that criteria are acceptable.
- 3.2.4.1 Annex A Symbol 1, Read Tool Manual.

3.2.4.2 Annex A Symbol 2, Wear Eye Protection.

3.2.4.3 Annex A Symbol 3, Personal Injury.

3.2.5 There are two annexes in this standard related to marking. Annex A and Annex B are informative and do not present mandatory requirements.

3.2.6 Tools manufactured with selective actuation, or which can be converted to another actuation system, shall be marked to indicate the actuation system selected. Color is an acceptable means of marking.

3.3 Over Pressure

3.3.1 Tool Body

The pressure vessel of the tool shall be designed to withstand, for a period of two minutes without rupturing, hydrostatic pressure of five (5) times the maximum air pressure when applied to the air inlet port and with all vents from the vessel closed.¹

3.3.2 Fully Assembled Tool

The tool shall be designed so that it does not self-actuate while pressurized, for a period of two minutes, by a power source of at least 1.5 times (+ 5 % – 0 %) the maximum air pressure or 200 psig (13.8 bar), whichever is greater.

3.4 Modified Tools

Tools shall not be modified unless authorized in tool manual or approved in writing by tool manufacturer. Modified or altered tools shall comply with this standard.

4 Tool Operation

4.1 Responsibility

The employer, tool owner and tool operator² are responsible for the safe use of the tool by, at a minimum:

¹ Hydrostatic pressure testing is safer than testing with compressed air. The **tool** usually must be modified to achieve the test pressure by preventing pressure loss through fluid leakage. This modification typically involves removing **trigger** and valve mechanisms and plugging openings.

² In the case where the **tool** operator is the **tool** owner, or is not working for an **employer**, the **tool** operator assumes the responsibilities of the **employer**.

- 4.1.1 Choosing the correct tool to perform the task.
- 4.1.2 Ensuring that the manufacturer's tool operating/safety instructions are available to operators.
- 4.1.3 Allowing only persons who have read and understood the tool operating/safety instructions to operate the tool.
- 4.1.4 Training the operator in the safe use of the tool as described in the instruction manual, including the requirements of Clause 7.
- 4.1.5 Selecting an appropriate tool actuation system from options available under Clause 3.1.3 and Clause 3.1.4, taking into consideration the work applications for which the tool is used and the proficiency of the tool operator. Only a professional or experienced user should use the contact actuating system. An inexperienced user should select a sequential actuating system. Use a sequential actuating system when precision fastener placement is desired. Use a sequential actuating system when user is working in a tight space or when in an awkward position where it is difficult to control recoil.
- 4.1.6 Allowing tool use only when the tool operator and all other personnel in the work area are wearing appropriate eye protection equipment according to Clause 4.2.1, and when required, other appropriate personal protective equipment such as head, hearing and foot protection equipment.
- 4.1.7 Ensuring the tool is in good working condition.
- 4.1.8 Establishing work procedures for nailer operations.

4.2 Personal Protective Equipment

4.2.1 Eye Protection Devices

Eye protection devices shall conform to the requirements of ANSI Z87.1, *American National Standard for Occupational and Educational Personal Eye and Face Protection Devices*, for impact resistance, with sideshields. They shall be marked with Z87+, and provide protection against flying particles both from the front and side.

4.2.2 Head Protection

Head protection shall conform to ANSI Z89.1, "American National Standard for Industrial Head Protection."

4.2.3 Hearing Protection

Hearing protection shall have a Noise Reduction Rating (NRR) determined in accordance with US Environmental Protection Agency rules that is appropriate for the noise exposure³.

4.2.4 Foot Protection

Foot protection shall conform to ASTM F2413, “Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear”

4.3 Nailer Work Procedures

4.3.1 Before starting work, test nailer according to the tool manual

4.3.2 Before starting work check the trigger setting (if selectable)

4.3.3 Remove broken or malfunctioning nailers from service immediately

4.3.4 Select appropriate trigger setting or actuation system based on application and operator training and proficiency

4.3.5 Properly maintain compressor: Drain daily and set to lowest pressure setting which will do the job.

5 Tool Maintenance

5.1 Responsibility for Proper Tool Maintenance

5.1.1 Responsibility

The employer, tool owner and tool operator⁴:

³ OSHA’s standard for exposure to continuous noise levels (29 CFR 1926.52) addresses both the noise level and the duration of exposure. In this standard, workers exposed for 15 minutes at 115 A-weighted decibels (dBA) have the same exposure as workers exposed for 8 hours at 90 dBA.

The NIOSH and OSHA limit for impulse noise is 140 decibels: above this level a single exposure can cause instant damage to the ear.

NIOSH recommends that an 8-hour exposure should not exceed 85 dBA and a one-second exposure should not exceed 130 dBA without using hearing protection.

⁴ In the case where the **tool** operator is the **tool** owner, or is not working for an **employer**, the **tool** operator assumes the responsibilities of the **employer**.

- 5.1.1.1 Are responsible for ensuring that tools are kept in safe working order as described in the tool operating/safety instructions.
- 5.1.1.2 Are responsible for ensuring that only qualified personnel shall repair the tool.
- 5.1.1.3 Are responsible for ensuring that manufacturer's tool maintenance instructions are available to personnel performing maintenance.
- 5.1.1.4 Are responsible for ensuring that tools that require repair are removed from service and that tags and physical segregation are used as a means of control.
- 5.1.1.5 Are responsible for ensuring that tools do not have any safety features disabled and are not modified without manufacturer's prior authorization.

5.2 Repair Parts and Accessories

Tools shall be repaired or equipped only with parts or accessories that are supplied or recommended by the tool manufacturer, or with parts or accessories that perform equivalently to those supplied or recommended by the tool manufacturer.

6 Tool Maintenance Instructions

6.1 Responsibility

- 6.1.1 The tool manufacturer or distributor shall make available written information on the proper maintenance instructions to follow for each tool.
- 6.1.2 The employer, tool owner and tool operator⁵ are responsible for:
 - 6.1.2.1 ensuring that the tool maintenance instructions are available to the appropriate personnel.
 - 6.1.2.2 proper maintenance of all tools in their possession.

6.2 Contents

⁵ In the case where the **tool** operator is the **tool** owner, or is not working for an **employer**, the **tool** operator assumes the responsibilities of the **employer**.

- 6.2.1 The principles of ANSI Z535.6, *American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials*, related to design and location of product safety messages in instructions may be used as guidelines for safety messages.
- 6.2.2 The tool maintenance instructions shall include the following:
 - 6.2.2.1 Instruction to keep the tools safe by regular maintenance.
 - 6.2.2.2 A list of the maintenance operations that the user shall carry out.
 - 6.2.2.3 Frequency of maintenance, for instance, after a specified time of operation, a specified number of cycles/operations or a stated number of times per year.
 - 6.2.2.4 Instructions on how the user is to perform regular maintenance tasks.
 - 6.2.2.5 Instructions for lubrication, if required.
 - 6.2.2.6 Instructions for clearing a jam.
 - 6.2.2.7 Common signs that repair or maintenance is needed.
 - 6.2.2.8 Tool conditions that require tool to be taken out of service.
 - 6.2.2.9 What maintenance and repairs may be done by employer, tool owner or tool user and what must be done by authorized manufacturer's representative.
 - 6.2.2.10 Only qualified personnel shall repair the tool and shall use parts as described in Clause 5.2.
 - 6.2.2.11 Tool Operating/Safety Instructions as described in Section 7.

7 Tool Operating/Safety Instructions

7.1 Development

The tool manufacturer shall develop instructions for each tool regarding the tool's safe operation taking into consideration Sections 4, 5 and 6. The information provided by the manufacturer is an important but not exclusive basis for safe use of the tool. It should provide sufficient information for the end user to perform an initial risk assessment. Such instructions are traditionally provided in the form of printed booklets, but other media may be used. These

instructions may be produced as a single item (manual, etc.) or may be produced as a set of items that together include the required information. The principles of ANSI Z535.6 related to design and location of product safety messages in instructions may be used as guidelines for safety messages.

Each fastener driving tool shall be accompanied by operating instructions drawn up by the manufacturer or his authorized representative.

The operating instructions shall include a description of the correct use of the tool. The operator's instruction shall state that any other use is forbidden. Fastener driving tools with continual contact actuation or contact actuation shall only be used for production applications.

The operating instructions shall include:

- a) name and address of the manufacturer
- b) model number of the tool
- c) information stating whether the tool is designed to drive fasteners into hard surfaces like steel and concrete
- d) minimum and maximum operating pressures
- e) explanations of any symbols marked on the tool
- f) correct mode of connection to the air supply
- g) action to be taken in the event of operational difficulties such as jamming and rectification of such difficulties
- h) diagram showing the parts or construction of the fastener driving tool
- i) specification of the fasteners which can be used, which include minimum and maximum diameter, length, and fastener characteristics, such as gauge and angle.

In addition, the instructions and warnings stated in Section 7.4 shall be given with all fastener driving tools unless the manufacturer determines they are not relevant to a particular fastener driving tool. Words of equivalent meaning may be used.

7.2 Provision

The tool manufacturer or distributor shall provide the instructions described in Clause 7.1 with each tool. Tools sold or otherwise delivered into the workplace, typically to an employer, shall be accompanied by these instructions.

7.3 Replacement

The tool manufacturer or distributor shall make additional tool operating/safety instructions available to requesting employers and requesting operators.

7.4 Contents

Instructions on the following subject matter shall be included:

7.4.1 Actuation systems

7.4.1.1 Availability of different actuation system options

7.4.1.2 How to obtain different actuation system options

7.4.1.3 How to operate different actuation system options

7.4.1.4 How to determine the actuation system selected

7.4.2 Flammable Atmospheres

Do not operate tool in explosive atmospheres, such as in the presence of flammable liquids, gases or combustible dust.

7.4.3 Contact with Electric Power

Do not operate tool where contact with electric power is possible. The tool is not insulated from coming into contact with electric power.

7.4.4 Tool modification

The tool shall not be modified unless authorized in the tool manual or approved in writing by the tool manufacturer. Modifications may reduce the effectiveness of safety measures and increase the risks to the operator and/or bystander.

7.4.5 Tool maintenance

Refer to the tool maintenance instructions for detailed information on the proper maintenance of a tool.

7.4.6 Recommended fasteners and accessories

7.4.6.1 Use only fasteners made or recommended by the tool manufacturer, or fasteners that perform equivalently to those recommended by the manufacturer.

7.4.6.2 Use only accessories made or recommended by the tool manufacturer, or accessories that perform equivalently to those recommended by the manufacturer.

- 7.4.6.3 Use only lubrication made or recommended by the tool manufacturer or lubricant that performs equivalently to that recommended by the manufacturer.

7.4.7 Personal Protective Equipment

- 7.4.7.1 Appropriate personal protective equipment is to be worn.

- 7.4.7.2 Eye protection

- 7.4.7.2.1 A written warning intended for the tool operator that eye protection equipment in accordance with Clause 4.2.1 must be worn by the operator and other people in the work area.

- 7.4.7.2.2 A written warning intended for the employer that the employer is responsible to enforce the use of eye protection equipment by the tool operator and all other personnel in the work area.

7.4.8 Inspect tool before operating to:

- 7.4.8.1 Establish use of proper power source as set forth in Section 8.
- 7.4.8.2 Determine that tool is in proper working order. Always check the tool before use for missing, broken, misconnected or worn parts.
- 7.4.8.3 Determine actuation system. If using this tool in selective actuation mode, always ensure it is in the correct actuation setting.
- 7.4.8.4 Check for misalignment or binding of moving parts and any other condition that may affect tool operation.
- 7.4.8.5 Ensure that safety labels are not missing. Do not use a tool with missing or damaged safety warning label(s).

7.4.9 Operating controls

- 7.4.9.1 A tool that is not in proper working order must not be used. Tags and physical segregation shall be used for control.
- 7.4.9.2 Do not remove, tamper with, or otherwise cause tool operating controls to become inoperable.

- 7.4.9.3 Do not operate tool if any portion of the tool operating controls is inoperable, disconnected, altered, or not working properly.

7.4.10 Tool handling

- 7.4.10.1 Read and understand the manual prior to use. Only persons who have read and understand the tool operating/safety instructions should operate the tool. Do not discard these instructions.
- 7.4.10.2 Always assume that tool contains fasteners.
- 7.4.10.3 Do not point tool toward yourself or others whether it contains fasteners or not.
- 7.4.10.4 Keep bystanders and children away while operating tool.
- 7.4.10.5 Do not actuate tool unless tool is placed firmly against the workpiece.
- 7.4.10.6 Respect tool as a working implement.
- 7.4.10.7 Do not engage in horseplay.
- 7.4.10.8 Stay alert, focus on your work and use common sense when working with tools.
- 7.4.10.9 Do not use tool while tired, after having consumed drugs or alcohol, or while under the influence of medication.
- 7.4.10.10 Do not overreach. Keep proper footing and balance at all times. Only use in a safe working place.
- 7.4.10.11 Do not hold or carry tool with a finger on the trigger. Keep fingers away from trigger when not operating this tool and when moving from one operating position to another.
- 7.4.10.12 Drive fasteners into proper work surface only.
- 7.4.10.13 Do not drive fasteners into other fasteners.
- 7.4.10.14 After driving a fastener, tool may spring back (“recoil”) causing it to move away from the work surface. To reduce risk of injury always manage recoil by:

- 7.4.10.14.1 Always maintaining control of tool. Hold the tool securely.
- 7.4.10.14.2 Allowing recoil to move tool away from work surface.
- 7.4.10.14.3 Not resisting recoil such that tool will be forced back into the work surface. In “Contact Actuation Mode,” if workpiece contact is allowed to re-contact work surface before the trigger is released, an unintended discharge of a fastener will occur.
- 7.4.10.14.4 Keeping face and body parts away from tool.
- 7.4.10.15 Fasteners can deflect and cause injury. When working close to an edge of a workpiece or at steep angles use care to minimize chipping, splitting or splintering, or free flight or ricochet of fasteners, which may cause injury.
- 7.4.10.16 Keep head hands and body away from fastener discharge area of tool. Keep all body parts such as hands and legs, etc. away from firing direction.
- 7.4.10.17 When using a tool intended to be used on hard surfaces such as steel and concrete, keep the tool perpendicular to the work surface to prevent slipping.
- 7.4.10.18 During operation, debris from workpiece and fastener collation material may be discharged.
- 7.4.10.19 Be careful when handling fasteners, especially when loading and unloading, as the fasteners have sharp points which could cause injury.
- 7.4.10.20 Do not load tool with fasteners when any one of the operating controls is activated.
- 7.4.10.21 Do not operate tool with any power source other than that specified in tool operating/safety instructions.
- 7.4.10.22 Do not operate tool with any operating pressure other than that specified in tool operating/safety instructions.
- 7.4.10.23 Do not operate the tool if it has been damaged.

- 7.4.10.24 Always select an actuation system that is appropriate to the fastener application and the training or experience of the operator.
- 7.4.10.25 Use extra caution when driving fasteners into existing walls or other blind areas to prevent contact with hidden objects (e.g., wires, pipes.) or persons on other side. Ensure fastener cannot penetrate the workpiece into parts of the body.
- 7.4.10.26 Do not hang, lift, pull or lower tool by the hose.
- 7.4.10.27 Be aware of trip hazards caused by the air hose.

7.4.11 Disconnecting tool

Disconnect tool from the power source when:

- 7.4.11.1 Not in use
- 7.4.11.2 Changing or replacing accessories such as the workpiece contact or joist hanger
- 7.4.11.3 Making any adjustments
- 7.4.11.4 Performing any maintenance or repairs
- 7.4.11.5 Clearing a jam
- 7.4.11.6 Elevating, lowering or otherwise moving the tool to a new location
- 7.4.11.7 Tool is outside of the operator's supervision or control; or
- 7.4.11.8 Removing fasteners from the magazine.

8 Power Source

8.1 Safe Power Source

The compressed air power source shall be pressure-regulated. The regulated pressure must not exceed the maximum air pressure marked on tool. If a regulator fails, the pressure delivered to a tool must not exceed 1.5 times the maximum air pressure, or 200 psig (13.8 bar),

whichever is greater.⁶ A tool normally is not operated at the maximum air pressure but at a lower pressure determined by the type of fastener used, the workpiece, and other conditions of use. Tools shall be used at the lowest pressure required for the operation.

Compressed air can be hazardous if not used properly. Never point compressed air at yourself or anyone else. Whipping hoses can cause injury. Always check hoses for damage and loose fittings.

8.2 Hazardous Power Source

Hazardous power sources shall not be used. Explosion may occur. Hazardous power sources include, but are not limited to:

8.2.1 Reactive gases including, but not limited to, oxygen and combustible gases.

8.2.2 Pressure sources that can deliver in excess of 1.5 times the maximum air pressure of a tool or 200 psig (13.8 bar), whichever is greater, if a regulator fails.

8.3 Regulator

Pressure regulators shall be used to limit compressed air pressure supplied to tool. Regulators shall be set at an operating pressure that is lower than or equal to the tool manufacturer's specified maximum air pressure.

8.4 Hose

Compressed air supply hoses shall have a minimum working pressure rating equal to or greater than the pressure from the power source if a regulator fails, or 150 psig (10.3 bar), whichever is greater.

8.5 Disconnect

Tools shall only be used with a fitting or hose coupling attached in such a manner that all compressed air in tool is discharged at the time the fitting or hose coupling is disconnected.

⁶ Power source pressure-limiting is normally accomplished by use of one or more pressure-limiting devices, such as pressure relief valve(s) or rupture disc(s).

Annex A
(informative)

The symbols below are examples of appropriate symbols.

A.1 Per Clause 3.2.4 alternate symbols evaluated in accordance with ANSI Z535.3 and meeting that criteria or ISO 3864-2 are acceptable.

Symbols

SYMBOL 1: Read Tool Manual



Figure A1

SYMBOL 2: Wear Eye Protection

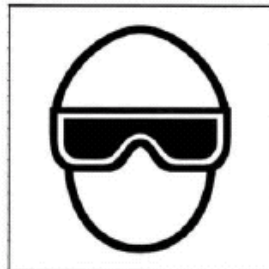


Figure A2

SYMBOL 3: Personal Injury

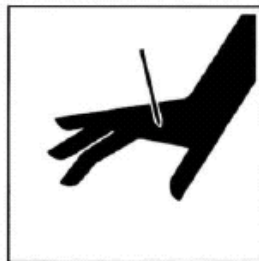


Figure A3

Annex B
(informative)

Exemplar Tool Label Meeting Marking Requirements

B1. Development of Label

All recommendations of ANSI Z535.3 regarding label type style, type size, use of upper/lower case, etc. were followed.

B2. Layout

Figures B1 and B2 are example layouts of symbols and text messages. Layouts may vary on a tool based on considerations such as area and shape of spaces available on tool for a label.

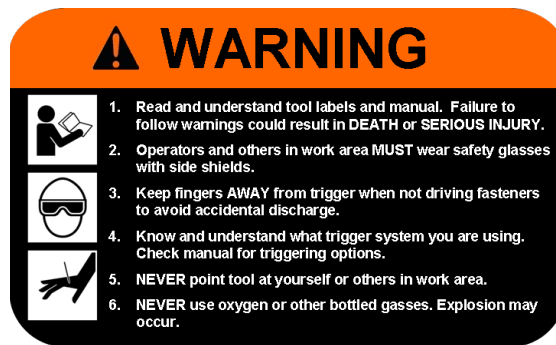


Figure B1

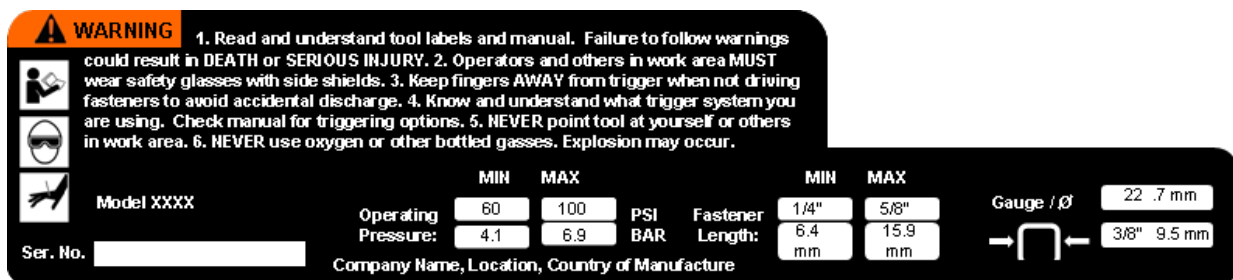


Figure B2

Note: Use of safety orange in signal word panel of both sample labels corresponds to use of the signal word “Warning,” whereas safety red would be used in signal word panel if signal word was “Danger.”

Annex C
(informative)

Referenced American National Standards

Below is a list of American National Standards referenced in this standard.

ANSI Z87.1- 2020, American National Standard for Occupational and Educational Personal Eye and Face Protection Devices.

ANSI Z89.1-20014, American National Standard for Industrial Head Protection.

ANSI Z535.1-2017, American National Standard for Safety Colors.

ANSI Z535.3-2011, American National Standard for Criteria for Safety Symbols.

ANSI Z535.4-2011, American National Standard for Product Safety Signs and Labels.

ANSI Z535.6-2011, American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials.

ASTM F2413-2018, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear

ISO 3864-2:2016, Graphical Symbols - Safety Colours And Safety Signs - Part 2: Design Principles For Product Safety Labels